

MAKEREADY

●
*... the details
and
the techniques*



CROMWELL PAPER COMPANY

*Photographs courtesy of The Carnegie
Institute of Technology, Pittsburgh, Pa.
and Vandercook Research, Inc.,
Chicago, Ill.*

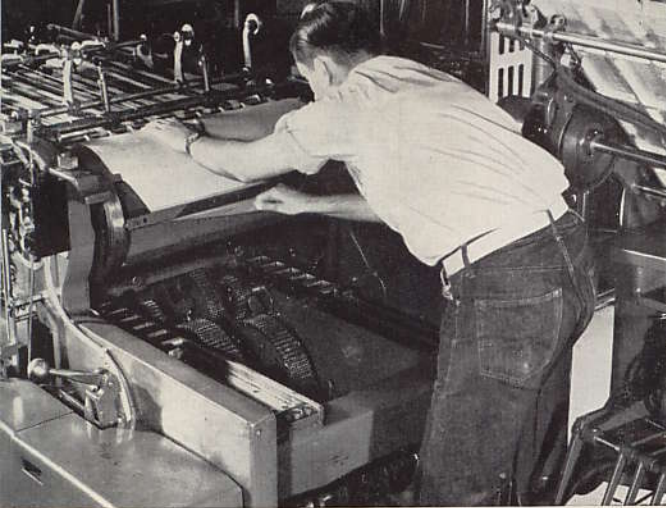
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FOREWORD

The Cromwell Paper Company offers this booklet as another of its services to promote better printing. The booklet has been designed to:

- Help the printer teach apprentices.
- Be a reference to students of graphic arts classes.
- Be a handy reference for pressmen and plant managers.

To assure the best work in printing, don't just ask for "tympan," ask for
C R O M W E L L T Y M P A N



Pressman puts new packing on the Miller SG 19 x 25 Automatic.

MECHANICAL MAKEREADY:

Better Quality at Lower Cost

Makeready corrects

1. Inaccuracies in printing surfaces
2. Adjusts printing surface heights for proper impression pressures.

Mechanical makeready methods are designed

1. To prevent errors during preparation of forms
2. To provide the various heights which will permit printing these forms without makeready.

The second point listed above is known as "premakeready," which is pre-pressroom compensation of the plate to assure proper pressure for dark areas, and an even impression from center to edge.

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Premakeready depends on precision machines and tools, materials of standardized quality, skilled workmanship, and careful attention to detail.

The success of mechanical makeready depends upon attention to tolerances in the vicinity of .001 inch.

THE PRESS

To keep your press in top running shape:

1. Keep press parts clean and well lubricated.
2. Check to keep bed level and flat.

You can check bed inaccuracies by saving and comparing the first press proofs of twenty-five different, consecutive forms. Heavy or weak areas will indicate such bed inaccuracies.

3. Correct bed inaccuracies with a permanent overlay sheet buried deep in the packing.
4. Check presses at regular intervals for wearing of parts, vibration, or settling of the floor underneath the press.

ROLLERS

Here are three tips on the use of rollers which may prove helpful:

1. Use only best-quality composition form rollers, and keep them adjusted accurately.
2. Distributor and ductor rollers of rubber usually give longer life and easier maintenance.
3. Where frequent color wash-ups are necessary, vulcanized oil

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rollers may be more satisfactory for distributors than rubber, because their smoother surface is easier to clean.

TYPES

For dependable results with type forms:

1. Proof foundry and Monotype composition on precision proof presses.
2. Use standardized calendered paper, to check for broken or worn letters.
3. Proof type from the bed plate of the press, not from galleys.
4. Check type heights regularly with a micrometer.

An interesting sidelight to precision printing with Monotype composition is the use of the Letouzey method, in which letters of heavy printing surface are some ten-thousandths of an inch higher than letters with little printing surface.

SLUGS

Check slug cast composition on a precision proof press, too. Be on the lookout for:

1. Cold or hot slugs, porous slugs
2. Metal fins between characters
3. Unaligned letters caused by damaged matrices.

Careful attention to knife settings on slug-composing machines will help to eliminate many inaccuracies.

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SPACING MATERIALS

If your plant is not air-conditioned, use wood spacing materials with care. Metal which has been checked for accuracy of dimensions and squareness will retain its size despite humidity changes, while wood is subject to swelling and shrinking.

ENGRAVINGS

Check your photo engravings and electrotypes for:

1. Shallow etching
2. Under-cut dots
3. Surface damage
4. Type height
5. Warped bases.

Ask the plate maker to make his test proofs on the paper which will be used in printing the job. *Most troubles with new plates come from trying to get by with poor-quality plates.*



Check engravings for proper dot formation.

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PLATE MAKEREADY

Mechanical makeready of plates is done by skilled craftsmen, who are experienced in handling plates on the press. There is no substitute for experience at this point. For example:

1. The depth of etching may be tested with a halftone meter, but this test will not indicate dots under-cut in etching.
2. Undercutting makes electrotyping virtually impossible, and results in serious press difficulties.
3. Plate type height checked with a Hacker gauge will show high or low spots in the mounting. These should be eliminated by underlaying or interlaying.
4. Compensate for dense and light printing areas at this time.

Check plates for type height. Dial readings reveal high and low spots, which are eliminated by underlaying or interlaying.



A simple patent base mounting interlay can save much makeready. More intricate interlaying is sometimes required.



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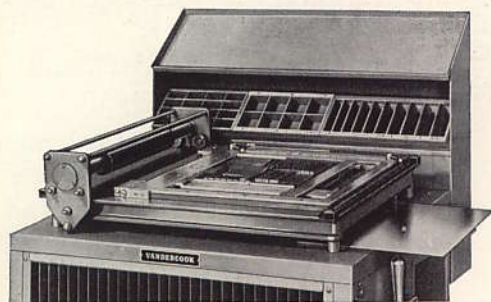
MOUNTING

The height of a plate depends on its mounting.

1. *Wood mounting*: wood mountings are in general use, but should be checked for warpage.
2. *Patent base mounting*: a well-made electrotype, carefully interlayed on a patent base may often be printed with no overlay. Check patent bases as new units are purchased, to be sure that all pieces are exactly the same height. Clean all patent bases regularly to prevent the accumulation of ink and dirt on top or bottom surfaces.
3. *Vandercook Base and Backing*: a new development of Vandercook Research, Inc., the mounting consists of a grooved metal plate, cast from type metal and planed to height in the printing plant. The plate is attached to the base with a Thermo-Plastic Bonding Film, eliminating nails and "spring back."

PAGE MAKE-UP

Successful page make-up requires careful control of all materials used in the form. Two modern developments to simplify page make-up are:



1. The Vandercook make-up gauge.

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With this gauge, forms are exactly square and exactly the same size, and can be justified and tested for lift, under gauge pressure. The Vandercook gauge simplifies multiple color or register forms.

2. The *Taylor Registerscope* utilizes a half-silvered mirror to impose the reflection of a proof of the key form on subsequent forms being made upon the stone. This equipment aids in alignment and breaking for color.

PAPER AND INK

Precision production depends upon the proper selections of paper and ink. The correct selection of paper and inks designed to print upon this paper is a "must" for best results. In case of very unusual jobs, you can send sample sheets of the paper with complete specifications of the job and press to an ink manufacturer, for formulation of correct ink to the paper.

AIR-CONDITIONING

Air-conditioning equipment which controls humidity, cleanliness, and movement of air can be very helpful to the printer. Ideal year-round conditions would include:

1. A temperature of 72° F., and
2. 50% relative humidity.

Changes in room temperature and humidity:

1. Cause wood furniture and mountings to shrink, swell, and warp, leading to register and justification troubles.
2. Affect paper, inks, and rollers,

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adding to makeready and running problems.

USE OF ELECTROTYPES WITHOUT PRESS OVERLAYS

Electrotype plates can sometimes be run without press overlays. This is widely practiced on rotary presses, and can be adapted to cylinder work, particularly if the form consists entirely of electrotypes mounted on a patent base. Plates so prepared have:

1. Solid areas .002 inch above type height
2. Middle tones type high
3. Highlights .002 inch below type height.

This is done by cutting face and back matrices in exact reverse to one another, from proofs made on a laminated paper. The paper has several thicknesses, so that different tones may be built up, or cut out as needed. The cut matrices are registered on the face and back of the plate, and enough pressure is applied to force the highlights down and the solids up. After pressing, matrices are removed and the back of the plate is shaved to remove pressure marks; the plate is thicker in solid areas than in highlights, exerting the needed additional pressure for printing solid areas.

We have just considered the general factors which will make a printing job easy or difficult for the pressmen. Now let's consider press preparation in some detail.

PRESS PREPARATION FOR MAKEREADY

The order of press preparation for makeready depends upon each press-

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man, but generally includes the following steps:

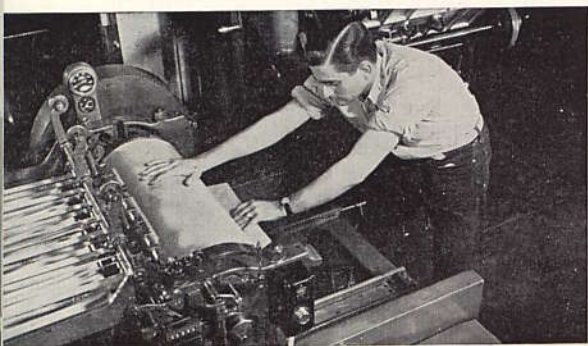
1. Lubrication
2. Packing change
3. Roller check and adjustment
4. Ink fountain setting
5. Location of form on press bed
6. Clamping of form
7. Position of form on the sheet.

LUBRICATION

The importance of lubrication cannot be overemphasized as a factor in profitable operation of any press.

1. Use the right lubricant at each point of wear
2. Establish a routine for a set number of hours running time.

Details of proper lubricants are furnished by press manufacturers.



Hard packing gives sharper impressions with less wear on the form, and helps eliminate impression on back side of sheet.

PACKING

Here are some points of interest on packing:

1. The packing must be replaced through the deepest sheet which

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shows any trace of impression from the previous run.

2. The packing used differs with the nature of the job and the paper.
3. A hard packing produces a more uniform surface, gives sharper impressions with less wear on the form, and prevents the showing of impression on the back of the printed sheet.

A typical packing for a job cylinder press under-cut .054" should be:

1. Four sheets of .006 Cromwell Tympan hangers next to the cylinder
2. Four sheets of .003 S & SC
3. Two more hangers of .006 Cromwell Tympan
4. And a .006 Cromwell Tympan top sheet.

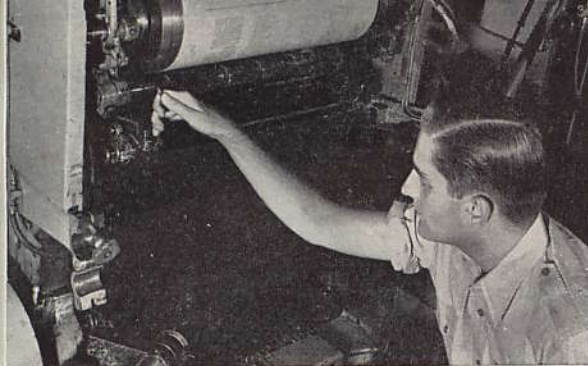
The S & SC may be removed to compensate for the thickness of the sheet being printed and for the addition of any overlay sheets to the packing. For long runs or extra heavy forms, paste the sheets together under the clamps. The packing, plus the sheet being printed, should equal the depth of the cylinder under-cut, plus .002 extra for impression.

Makeready is only as good as the tympan paper used to prepare the hard packing. Good tympan has four dependable qualities:

1. Hard, uniform surface
2. High tensile strength
3. Resistance to oil and solvents
4. Resistance to moisture and temperature extremes.

Cromwell Specially Prepared Tympan meets each of these requirements.

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Proper roller adjustment is essential always. Here, pressman adjusts rollers on a Miehle Vertical.

ROLLER ADJUSTMENT

Periodic check of the setting of composition rollers is necessary to compensate for changes in size due to changes in temperature and humidity. Adjust rollers to the inkplate, and to the vibrators.

When only part of the roller length is being used for inking, cover the unused portion with a heavy grease to prevent frictional heat from melting the composition. While general practice has been to use as many distributor rollers as possible to insure adequate spreading, new fast-drying inks require the use of as few distributor rollers as possible, to get the ink from the fountain to the paper before it can dry on the rollers.

INK FOUNTAIN ADJUSTMENT

Place ink in the fountain, and begin fountain adjustment:

1. Loosen the tight keys.
2. Work from the center keys outward, until an even flow of ink appears on full roller length.

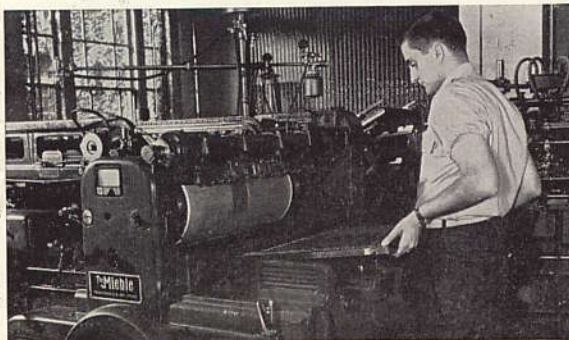
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This adjustment is easier when the ductor roller is placed in contact with the fountain roller.

3. Make final adjustment for variations in the amount of ink by running waste sheets through the press, and using these for a guide to ink distribution.

POSITIONING THE CHASE

1. Before placing the form on the press, wipe both the bed and the bottom of the form clean.
2. Slide the form on, with the outer edge of the chase lifted, so that underlays will not be torn or folded back by the edge of the bed.
3. Locate the chase so that the sheet can feed approximately in the center of the feed board.
4. Locate the form so that front guides can be set for proper grip or bite.
5. After positioning, unlock form, and clamp the chase securely.
6. Plane and re-lock the form.



Lift edge of form when positioning, so that underlays on a form locked in a chase will not be disturbed.

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PROOFING

Proofing on quadrule paper will shorten the time necessary for position and proofreader's approval, because this paper eliminates much of the measuring for position normally required.

Any press corrections now necessary should be made before the makeready is begun, to avoid possible form misregister with overlays.

MAKEREADY AND RUNNING

No set application of makeready applies to all types and sizes of presses or forms. Therefore, the following explanation indicates makeready on an ordinary form containing wood-mounted halftones and type or slugs, for a typical job cylinder press. The principles apply to both larger and smaller cylinder presses, and with some modifications to platen and rotary machines.

OVERLAYS

First rule of makeready: *Overlay a form only when obviously necessary.*

An overlay may be required to correct one or more of the following:

1. A non-uniform press impression surface
2. Form elements not type high
3. Varying impression requirements for heavy and light parts of form
4. Defects in the printing surface.

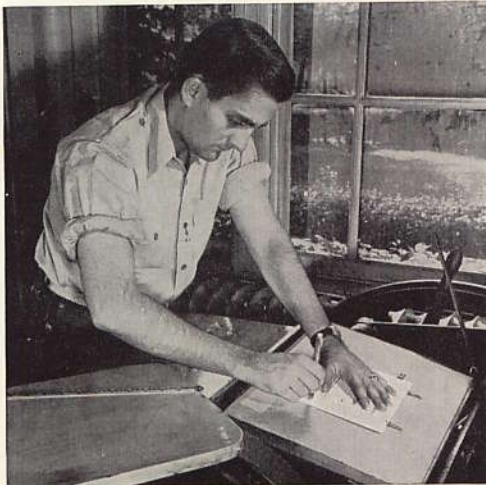
Overlaying is complicated by the tendency of a press to yield when pressure is applied. When pressure is

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added to any part of a form, the impression will be relieved somewhat on adjoining parts. On a cylinder press, this bearing-off is noticeable along the width of the cylinder; on a platen the impression yields all around the area where pressure has been added.

PROCEDURE FOR MAKING AN OVERLAY

1. Pull an overlay proof, by feeding a sheet through at running speed, and stopping the press just before the grippers release the sheet.
2. Stab register marks into the packing with an overlay knife.



Pressman stabs register marks with an overlay knife on this Chandler & Price platen press.

3. Release the sheet from the grippers, and if necessary, cut a narrow strip from the gripper edge of the sheet, to permit its location in the packing without buckling at the edge where the packing folds under the clamps.

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4. If the sheet is large, it may be divided into workable sections.
5. Mark this stabbed sheet for overlay. This is generally done on a mark-up table, equipped with racks holding the necessary thin papers and paste.

- a. Adjust either the table or the light source, to cast shadows from the impression which shows on the backside of the sheet. The variation in impression can be judged from these shadows, and light printing areas can be marked on the back of the sheet. These marks will indicate not only the location for tissue spots, but also the number of thicknesses required to bring the area up to proper printing pressure. Usually, no more than three thicknesses are added to any one overlay sheet.

- b. Mark for halftone and line plate overlays on the printed side. Position a piece of carbon paper under the plate areas, carbon side up, so that the lines drawn on the face of the sheet indicating weak areas will transfer to exactly the same position on the back of the sheet, with the lines previously marked for type overlay. Areas showing slightly excessive impression can be peeled or scraped.

Areas showing excessive impression may be cut from the overlay entirely to reduce this pressure.

SPOTTING

The sheet is now ready for spotting.

1. Place only a minimum of paste inside the outline. Too much paste disintegrates the tissue, makes lumps on the overlay which will show up on the printed result, and may damage some of the halftone dots.
2. Paste the tissue to the overlay, cut along the marked line and strip off the remainder.
3. When small spots are marked inside larger areas, paste these small spots first, so that they are covered and protected by the larger spots.

INTERLEAFING

After spotting:

1. Cut out stab marks on the overlay to match corresponding marks in the packing.
2. Open the packing, and remove a sheet of equal thickness to compensate for the thickness of the overlay sheet.

The overlay sheet must register exactly with stab marks previously made.



3. Register the overlay sheet exactly with the stab marks, and paste securely in place.
4. Place the overlay sheet not less than .012 and not more than .024 inches underneath the draw sheet. An overlay too near the draw sheet tends to show the spots outlined, particularly in plates. Too deep an overlay loses much of the desired effect since the press tends to distribute the additional pressure over larger areas.
5. Close the packing, and test the overlay. Print a trial sheet at running speed and check to see that the overlay brings out the weak areas.
6. For ordinary work, corrections of the overlay can be made on the face side of the sheet as it hangs in the packing.
7. For high quality printing, a second, and sometimes a third overlay is needed to bring out fine gradations of tone in the halftone plates. Such subsequent overlays are made in the same manner as the first.

MECHANICAL OVERLAYS

Mechanical overlays are used to make long runs from halftones. They are generally made on a precision proof press and registered in on a separate overlay sheet. Several processes have been developed which use both paper and metal bases, treated with liquids or dry powders. These include:

1. A biscuit overlay. Print the halftone with a sizing ink, cover

the wet surface with flour, and set the flour with an alcohol-shellac solution.

2. The metallic overlay requires a proof made on a sheet of grained zinc, using an acid-resistant ink. Resulting dots are powdered, and heated to form a protective coating, and the plate is then etched to remove metal where the pressure is not desired.
3. Chalk overlays utilize a prepared overlay paper, proofed with a special ink. The resulting print is etched in a chloride of lime solution, which removes chalk in proportion to the weights of the various tones in the plate—solid tones have the most chalk remaining, and highlights very little.

MISCELLANEOUS FACTORS

Several other factors can affect the makeready appearance of the sheet.

These include:

1. Proper inking
2. Proper matching
3. Register
4. Press corrections of typographical errors
5. Form imperfections
6. Work-ups
7. Slurs
8. Ghosts
9. "Offsetting"
10. Wrinkles.